RESPONSE TO COMMENTS FROM THE STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE 1999 ANNUAL REPORT, MONITORING EVENTS 14 AND 15 SITE 9: NEPTUNE DRIVE DISPOSAL SITE NAVAL AIR STATION, BRUNSWICK, MAINE

COMMENTOR: Claudia Sait **DATED: 4 April 2000**

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the report entitled *1999 Annual Report, Monitoring Events 14 and 15, Site 9: Neptune Drive Disposal Site*, dated February 2000, prepared by EA Engineering, Science, and Technology. Based on that review, the Department has the following comments and issues.

Each of our comments is followed with a code that indicates whether a response is required (RR), no response is required (NR), editorial correction needed (ED), or meeting discussion requested (MTG). No response is required for editorial corrections unless the Navy disagrees with the correction.

GENERAL COMMENTS

1. The Department is pleased that the Navy plans to collect additional data in 2000 for direct comparison of the Site 9 wells with Navy Exchange Service Station wells.

2. The Department is surprised that a pH field-recorded value of 2.08 for leachate seep LT-901 was not checked with a second field meter. While the likely explanation is a faulty meter, the Navy should not make this assumption for surfacing water that is not in a secured area. Historic inorganic analyses for sediment at LT-901 have shown elevated lead concentrations during two time periods prior to the cessation of sediment sampling in August 1998. Low pH and elevated lead levels might be related. If low pH is found during Monitoring Event 16, the Department will ask that inorganic analyses be reinstated and the source of the low pH investigated. (RR)

   Response—This was discussed at the 11 April 2000 Technical Meeting. On 11 April 2000 prior to the Technical Meeting, EA personnel measured the pH of LT-901 and the pH measurements ranged from 6.0 to 6.5, which is similar to all previous measurements with the exception of the erroneous measurement during Monitoring Event 15. Therefore, this measurement is assumed to be related to field or transcription error. For future sampling efforts, if a low or high pH reading (anomalous reading) is recorded in the field, it will be verified by field personnel to confirm the reading is a representative measurement of the field conditions. It is anticipated this field recording protocol will be included in the next revision of the Long-Term Monitoring Plans for each site.

SPECIFIC COMMENTS

3. ***Long-Term Monitoring Program, Section 1.2, Page 2, Bottom of Paragraph***—Ground-water elevation data were gathered to assess whether ground water from the Navy Exchange Service Station air sparging may be flowing to and affecting the ground-water geochemistry of Site 9.

   MEDEP appreciates the Navy including these upgradient wells, however, ground-water elevation data cannot directly be used to assess whether ground-water geochemistry is being affected downgradient. If a hydraulic connection is established using elevation data, then certain geochemistry parameters may be assessed for changes between upgradient and downgradient areas. MEDEP suggests the following change:

   > *Ground-water elevation data were gathered to assess whether ground water from the Navy Exchange Service Station air sparging may be flowing to ~~and affecting the groundwater geochemistry of~~ Site 9.* (ED)

   Response—The text has been changed in the final report as recommended.

4. ***Water Level Gauging Program, Section 3.1.1, Page 1, 1st Bullet***—Shallow ground water south of the upper impoundment pond is hydraulically unrelated to Site 9.

   This is not quite true; the pond is a discharge area for ground water immediately to the south. This statement would be better written as follows:

   > *Due to the presence of the pond, the quality of shallow ground water south of the pond is not linked to the quality of shallow ground water north of the pond.* (ED)

   Response—The text has been changed in the final report as recommended.

5. ***Summary and Conclusions, Sections 3.1.1 and 3.1.2, Pages 2 and 3, Water Level Gauging Program, Section 3.1.1, Page 2, Top of Page***—These dissolved oxygen concentrations measured during 1999 suggest that the ground-water geochemistry at Site 9 is not being affected by the operation of the remedial system at the Naval Exchange Service Station.

   Ground-Water Monitoring and Sampling Program, Section 3.1.2, Pages 2 and 3, 2nd and 3rd Bullets—Samples of Site 9 ground water have not reported significant concentrations of VOCs that would be commonly found in gasoline, which suggests impacts at Site 9 may be limited to potential impacts on site dissolved oxygen or Eh conditions.

   The Department disagrees with the first statement, and partially disagrees with the second statement. The presence of impacts to dissolved oxygen concentrations would be expected to noticeably alter ground-water geochemistry. Although BTEX compounds are virtually absent at wells MW-NASB-8, MW-NASB-9, and MW-NASB-10, diesel range organics are present in MW-NASB-9 and MW-NASB-10. Only 110 ft upgradient of MW-NASB-9, well MW-NASB-226 had a gasoline range organics concentration of 2,300 µg/L in December 1999. Total BTEX concentration at MW-NASB-226 was 1,600 µg/L.

It is our interpretation that oxygen-depleted ground water at the leading edge of the Navy Exchange Service Station fuel plume is migrating into Site 9 where the anaerobic water is causing an increased rate of dechlorination of DCE to vinyl chloride. Thus, the long-term oxygen depletion thought to be caused by BTEX degradation at the NEX could explain the 1998-1999 increasing vinyl chloride concentration trend downgradient. With the exception of MW-NASB-080 (which changed from low to moderate levels of dissolved oxygen in 1999), all other wells in the middle of Site 9 have shown either zero or very low oxygen concentrations. All wells with near normal oxygen concentrations farther downgradient are located within 100 ft of the impoundment drainage. It seems likely that the combined effect of shallowness of the ground water near the ponds and a probable state of exhausted dechlorination (having run its course just upgradient) would promote a recovery of oxygen in ground water downgradient of Building 201.

Response—We disagree with the interpretation noted in this comment that the addition of oxygen upgradient of Site 9 at NEX is likely to increase biodegradation. It is more likely that chlorinated solvent compounds will under go dechlorination in anaerobic conditions. It should be noted that many site conditions could be responsible for the volatile organic compounds trends observed in Site 9 ground water, and dissolved oxygen concentrations. The observations noted in this comment are one possible explanation, although other factors may explain these observed trends (i.e., seasonal fluctuations, precipitation, and/or a combination of seasonal factors).

a. Please eliminate the following sentence from Bullet 3 (Page 2 of 5):

~~These dissolved oxygen concentrations measured during 1999 suggest that the ground-water geochemistry at Site 9 is not being affected by operation of the remedial system at the Naval Exchange Service Station.~~ (ED)

Response—The text has been changed in the final report as recommended.

b. MEDEP recommends the following revision to Bullet 3 (Page 3 of 5):

Samples of Site 9 ground water have not reported significant concentrations of volatile organic compounds that would be commonly found in gasoline. Diesel range organics and gasoline range organics are not currently included in the analytical program at Site 9. ~~*which suggests impacts at Site 9 may be limited to potential impacts on site dissolved oxygen or Eh conditions*~~*. (ED)*

Response—The text has been changed in the final report as recommended.

6. ***Ground-Water Monitoring and Sampling Program, Section 3.1.2, Page 3, 2nd Bullet***

a. Therefore, based on current data, a source of vinyl chloride west of that portion of Site 9 does not appear likely.

Please delete this sentence as it is contradictory to the rest of the paragraph. (ED)

Response—The text has been changed in the final report as recommended.

b. The second to last sentence does not adequately describe the last 2-year trend at MW-NASB-069, the monitoring well with the highest concentrations of vinyl chloride and 1,2-DCE. While the sentence is acceptable for the other monitoring wells, MW-NASB-069 must be mentioned as an exception to the rise-and-fall pattern of vinyl chloride concentrations. (RR)

Response—The following text has been inserted as the last sentence in Section 3.1.2, Page 3 of 5, 2nd Bullet:

The increase and decrease of vinyl chloride concentrations also occurs; however, the overall trend of vinyl chloride detected in samples from MW-NASB-069 over the last 2 years has been increasing.

7. ***Analytical Trend Graphs, Appendix A***

a. LT-901 Sediment shows that sampling was terminated when the lead level had risen to over 120 mg/L for the second time in two years. If lead was eliminated from the Long-Term Monitoring Program, it may be necessary to reinstate it. What was the justification for discontinuing this sampling? (RR and MTG)

Response—This topic was discussed at the 11 April 2000 Technical Meeting. During discussions related to the revision to the Long-Term Monitoring Plan, metals analysis was added to monitoring wells located immediately downgradient of the landfill as these would better assess metals impact rather than samples from LT-901. In addition, the drainage catchment from LT-901 includes parking areas and industrialized portions of the base. Therefore, water collected from LT-901 may be affected by sources unrelated to Site 9.

b. MW-NASB-227 volatile in ground water is missing all detections for TCE and PCE for Monitoring Events 14 and 15. Please revise this graph. (ED)

Response—The graph has been checked to ensure that detections for TCE and PCE for Monitoring Events 14 and 15 were included. Please note that TCE and PCE detected concentrations are included as part of the "Total VOCs" in the graphs for all the wells.

8. ***Response to Comments from Maine DEP on Monitoring Event 14 – November 1998***

a. Comment No. 5—It is hard to ascertain from the Navy's response when the mentioned field check for verifying a second seep drainage into the North Branch of the Unnamed Stream will be accomplished. No changes are observed on the Site Plan, Figure 1-2 of the 1999 Annual Report. Has the Navy field checked the second seep drainage? If so, please provide more specific information on as to the date of the field check and the outcome. If not, please provide information on when the field check will be performed. (RR)

Response—This issue was discussed at the 11 April 2000 Technical Meeting. The seep was checked during Monitoring Event 16 field events, and will be reported in the Monitoring Event 16 Report.

b. Comment No. 7—The corrected version of Table 8 as promised in the Navy's response, has not been received. When can the Department expect this revised table? (RR)

Response—We suggest that MEDEP make a pen and ink edit to Table 8 in Monitoring Event 14 Report for Site 9 to modify "Total 1,2-Dichloroethane" to "Total 1,2-Dichloroethene."